

Perceived Stress in Diploma Pharmacy Students: A Comparative Cross-Sectional Analysis of First and Second Year Students

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ABSTRACT

Students especially those in professional courses, are exposed to different types of stress. High levels of stress may have a negative impact on academic performance as well as other aspects of a students' life. Studies regarding stress in pharmacy students are very few despite requirements by accreditation agencies for academic institutions to assess perceived stress in students. The present study was carried out in the Institute of Pharmacy, Gauhati Medical College among the first and second-year students of Diploma Pharmacy course to assess the levels and sources of stress among the student pharmacists. 72 students took part in the study. The mean PSS score was 20.06 ± 4.83 (19.64 ± 4.22 in males and 21.79 ± 6.73 in females). 50% students reported feeling nervous/stressed fairly often/very often. The most common stressors were related to academics such as performance in examination, expectation after graduation and increased class workload. Identifying the common student stressors and initiating appropriate steps to alleviate student stress helps to establish a good learning environment in a teaching institute.

Keywords: students, pharmacy, stress.

INTRODUCTION

Stress can be defined as "a state of mental or emotional strain or suspense" and also as "a number of normal reactions of the body (mental, emotional, and physiological) designed for self-preservation".⁽¹⁾ A person may be exposed to stress in a number of situations in life, whether academic, job-related or others. Positive experiences, such as the start of a new academic programme, may, at times, contribute to stress. This includes the stress related to academics as well as interpersonal, intrapersonal and environmental issues. Students in professional courses are, thus, exposed to

varying levels and different sources of stress. Stress in student pharmacists is significant because a correlation between increased stress and decreased health-related quality of life has been observed in at least one study of student pharmacists.⁽²⁾

The Accreditation Council for Pharmacy Education (ACPE), Chicago, Illinois is a national agency for the accreditation of professional degree programs in pharmacy and providers of continuing pharmacy education. ACPE (until 2003 known as the American Council on Pharmaceutical Education) was established in 1932 for the accreditation of

professional degree programs in pharmacy, and in 1975 its scope was broadened to include accreditation of providers of continuing pharmacy education. ACPE accreditation standards and guidelines specifically contain guidance for Standard 24.e regarding student stress: "Colleges and schools are encouraged to assess and correct underlying causes of ineffective learning experiences. Such assessments consider the amount of student effort, the quality of faculty teaching, and the appropriateness of learning assessments used within the courses. In this regard, these assessments include measurements of perceived stress in faculty, staff, and students and an evaluation of stress' potential for a negative impact on programmatic outcomes and morale." (3) While these accreditation standards have been updated for 2016, student affairs' professionals still work regularly to improve/enhance student wellness during pharmacy school. Despite ACPE recommendation and several tools being available, little literature is actually published examining stress levels in student pharmacists. (2,4-11)

With the above background, the present study was carried out with the following objectives:

1. To assess the level of perceived stress among the first and second year pharmacy students
2. To identify the sources of stress among the students
3. To determine the relation, if any, between perceived stress and academic performance
4. To compare the parameters between the first year and second year students

MATERIALS AND METHODS

The present study is a cross-sectional survey using self-administered questionnaire. The study was conducted in the Institute of Pharmacy, Gauhati Medical College among the first and second-year students of Diploma in Pharmacy (D.Pharm) course. The study protocol was

approved by the Institutional Ethics Committee, Gauhati Medical College. D.Pharm is a two-year course conducted under the Srimanta Sankaradeva University of Health Sciences, Assam. Six subjects (Human Anatomy and Physiology, Pharmacognosy, Pharmaceutical Chemistry, Pharmaceutics, Biochemistry and Clinical Pathology and Health education and community pharmacy) are taught in the first year and six subjects (Pharmacology and Toxicology, Hospital and Clinical Pharmacy, Pharmaceutical Chemistry, Pharmaceutics, Pharmaceutical jurisprudence and Drug store and business management in the second year. Both theory and practical classes are taken for all subjects except Health education and community pharmacy, Pharmaceutical jurisprudence and Drug store and business management, for which there are only theory classes. In each academic year, three Sessional examinations are conducted followed by a final examination at the end of the year. A minimum of 40% marks is required to pass in each subject. If a student fails in more than three subjects, he/she is not promoted to the next year. A minimum of 75% attendance in class lectures, both theory and practical, is required for a student to be eligible to appear in the final examination. There were 58 students each in the first and second year. The study procedure and the objectives of the study were explained to the students. It was explained to the students that their information will be kept confidential and will be used only for the purpose of the study. Participation in the study was on voluntary basis. 37 first-year students and 35 second-year students volunteered to take part in the study. Written informed consent in the prescribed format was taken from the students opting to participate in the study.

Study tool: The study questionnaire consists of 3 parts:

1. Part I: General Information
2. Part II: Perceived Stress Scale (PSS)

3. Part III: Student Stress Survey

The part on General Information had questions regarding socio-demographic profile of the study participants (described in Table 1), relationship with family and friends, leisure time activities and academic performance (self-reported examination score).

The Perceived Stress Scale (12) is the most widely used psychological instrument for measuring the perception of stress. The PSS is applicable for a variety of settings and subject types and includes stress measuring reactions to stressful situations as well as measure of stress (7-10 Marshall et al). PSS-10 scale was used to measure perceived stress in this study. PSS-10 consists of 10 questions, with responses varying from 0 to 4 for each item and ranging from never, almost never, sometimes, fairly often and very often respectively on the basis of occurrence during one month prior to survey. The possible range of scores varies from 0 to 40. The scores on the positive items (question no 4,5,7,8) are reversed (e.g.: 0=4,1=3,2=2 3=1,4=0) and then the scores of all the 10 items are summed to yield a single score. The cut – off value for the identification of stressed cases was taken as 20, with subjects having PSS scores >20 being classified as stressed and those having PSS≤20 classified as non-stressed.

The Student Stress Survey is a 34-item questionnaire which includes four categories of stressors: Academic (10 stressors), Inter-personal (8 stressors), Intra-personal (8 stressors) and Environmental (8 stressors). In each case, the students were asked to indicate whether or not they have experienced the particular stressor during the current academic year. If yes, they were further asked to indicate how frequently they have experienced the particular stressor (rarely, sometimes, often, and always) and scored as 1, 2, 3 and 4 respectively.

RESULTS

The Diploma in Pharmacy (D. Pharm) course is a 2-year course. In the session 2014-2015, there were 58 students each in the 1st as well as 2nd year, giving a total of 116 students. 37 1st year and 35 2nd year students voluntarily completed the questionnaire, giving a response rate of 63.7% and 60.3% respectively. Overall response rate was 62.1%. The mean age of the study subjects was 20.79±1.36 (Range 18-26years). Socio-demographic profile of the study sample is shown in Table 1.

Table 1: Socio-demographic profile of the study population

Characteristic		Number
Gender	Male	58
	Female	14
Resident of Guwahati	Yes	5
	No	67
Type of accommodation	Hostel	6
	Own house	3
	Rented house	53
	Paying guest	10
Staying with	Parents	5
	Relatives	2
	Friends	58
Religion	Alone	7
	Hindu	20
	Muslim	47
	Christian	1
	Did not respond	4
Age	≤20 years	36
	>20 years	36
Year of study	1 st year	37
	2 nd year	35

The mean PSS score of the D.Pharm students (first and second year combined) was 20.06±4.83. The score was higher in females (21.79±6.73) compared to males (19.64±4.22). The mean PSS score of the first-year students (n=37) was found to be 20.92±4.08. Mean PSS score of the males (n=32) was 21.16±2.99 and that of the females (n=5) was 19.40±8.76. The mean PSS score of the second-year students (n=35) was found to be 19.14±5.42. Mean PSS score of the males (n=26) was 17.77±4.78 and that of the females (n=9) was 23.11±5.44. Taking 20 as the cut-off value, the subjects were classified as stressed (PSS score > 20) and non-stressed (PSS score ≤ 20). 22 (59.46%) first-year students were found to be stressed as compared to 15 (42.86%) second-year students. Sample response

frequencies for the 10-item PSS survey are shown in Table 2. 50% of the students (43% first-year and 57% second-year)

reported feeling nervous or stressed fairly often to very often in the previous month.

Table 2: Sample response frequencies for the 10-item PSS survey

Question	Never	Rarely	Sometimes	Often	Always
1. In the last month, how often have you been upset because of something that happened unexpectedly?	6	14	27	15	10
2. In the last month, how often have you felt that you were unable to control the important things in your life?	8	11	20	24	9
3. In the last month, how often have you felt nervous and "stressed"?	5	13	18	24	12
4. In the last month, how often have you felt confident about your ability to handle your personal problems?	5	10	20	25	12
5. In the last month, how often have you felt that things were going your way?	6	17	21	15	3
6. In the last month, how often have you found that you could not cope with all the things that you had to do?	4	19	32	12	5
7. In the last month, how often have you been able to control irritations in your life?	7	19	22	15	9
8. In the last month, how often have you felt that you were on top of things?	12	15	28	12	4
9. In the last month, how often have you been angered because of things that were outside of your control?	7	22	24	11	8
10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	16	18	22	15	1

Table 3: Level of satisfaction of stressed and non-stressed subjects in their relationships with parents/family and friends

		STRESSED		NON-STRESSED	
		1 st year	2 nd year	1 st year	2 nd year
Relationship with friends	Satisfied/ Very satisfied	86%	93%	100%	100%
	Not satisfied	14%	7%	0	0
Relationship with parents	Satisfied/ Very satisfied	100%	100%	100%	100%
	Not satisfied	0	0	0	0

Table 4: Presence/absence of close friends among stressed and non-stressed subjects

Close friends	STRESSED		NON-STRESSED	
	1 st Year	2 nd Year	1 st Year	2 nd Year
YES	64%	87%	80%	90%
NO	36%	13%	20%	10%

Table 5: Comparison of sample response frequencies to question no.3 of PSS between stressed and non-stressed subjects

Feeling nervous/stressed fairly often/very often	Stressed No. (%)	Non-stressed No. (%)
1 st year	13 (59%)	3 (20%)
2 nd year	14 (93%)	6 (30%)

Further, the level of satisfaction of the subjects' relationship with their parents and friends was assessed in the general questionnaire. Subjects were asked to indicate whether they were "very satisfied", "satisfied" or "not satisfied" with the relationships. It was seen that a greater percentage of non-stressed subjects were either satisfied or very satisfied with their relationships with parents and friends; whereas a greater percentage of stressed subjects were "not satisfied" with the relationships. A greater percentage of non-stressed subjects had close friends. (Tables 3 and 4) Among both first and

second-year students, a greater percentage of stressed subjects reported feeling nervous or stressed fairly often to very often in the previous month. A greater percentage of second-year students (both stressed and non-stressed groups) reported feeling nervous/stressed fairly often/very often in the previous month. (Table 5)

The average marks obtained by the students in the Sessional examination for the first-years and Part-I Final examination for the second-years (expressed as percentage to achieve uniformity) was 47.65.54±10.88 among the first-years and 56.0±5.44 among the second-years. Table 6 shows the mean±SD values of the marks obtained in examination by the stressed and non-stressed subjects of both years of study. It is seen that the mean marks obtained in examination was higher among the non-stressed subjects compared to the stressed subjects.

Table 6: Comparison of marks obtained by stressed and non-stressed students of first and second year

	Marks obtained in examination (Mean±SD)	
	Stressed	Non-stressed
First year	45.25±10.76	51.35±10.39
Second year	54.40±6.43	57.24±4.28

The most common stressors of the pharmacy students (first and second year combined) were determined by calculating total response frequencies from the student stress survey. It was seen that the most frequently occurring source of stress was performance in examination (83%). The next three stressors were also related to

academics followed by personal and environmental stressors. Table 7 lists the most common stressors among the study population. Table 8 compares the most common stressors among the first and second year students. Table 9 shows the sample response frequencies for the Student Stress survey.

Table 7: Top ten most commonly occurring sources of stress

Sl. No.	Stressors	Number of responses (%)
1	Performance in examination	60 (83)
2	Expectation after graduation	54 (75)
3	Increased class workload	53 (74)
4	Frequency of examinations	48 (67)
5	Change in living environment, New responsibilities, Change in social activities	44 (61)
6	High parental expectations	43 (60)
7	Decline in personal health	42 (58)
8	Competition with classmates	41 (57)
9	Loneliness, Sleeping difficulties	40 (56)
10	Lack of personal interest in pharmacy course	35 (49)

Table 8: Comparison of most common stressors among first and second year students

	First year	Second year
1	Performance in examination (92%)	Performance in examination (74%)
2	Expectation after graduation (84%)	Increased class workload (69%)
3	Increased class workload (78%)	Expectation after graduation (66%)
4	Change in living environment (76%)	Frequency of examination (66%)
5	New responsibilities (73%)	Competition with classmates (63%)

Table 9: Sample response frequencies for student stress survey

Stressors	Rarely	Sometimes	Often	Always
1. Increased class workload	11	36	2	4
2. Performance in examination	7	30	14	9
3. Class attendance	6	15	8	11
4. Expectation after graduation	4	22	10	18
5. Dissatisfaction with class lectures	11	15	6	5
6. Non-availability of adequate learning materials	10	19	3	4
7. Frequency of exams	7	25	7	9
8. Competition with classmates	6	15	13	7
9. Performance in practicals	5	15	12	10
10. Difficulty in reading textbooks	14	12	6	2
11. Trouble finding a new friend	10	8	4	3
12. Trouble in working with un-acquainted people	15	11	6	2
13. Adjustment with room-mates	10	12	7	4
14. Change in social activities	12	22	6	4
15. Fight with friend	4	6	2	2
16. Trouble or disagreement with parents	8	6	2	2
17. Inability to socialize with classmates	9	9	0	1
18. Relationship with persons of the opposite gender	10	12	1	6
19. New responsibilities	11	21	6	6
20. Sleeping difficulties	10	15	10	5
21. Loss of appetite	15	18	3	3
22. Loneliness	10	15	11	4
23. Financial difficulties	9	16	5	11
24. Decline in personal health	15	16	7	4
25. Alcohol / smoking / drug abuse	4	3	1	3
26. Lack of a personal interest in pharmacy course	12	13	4	6
27. High parental expectations	11	17	5	10
28. Lack of time for recreation	12	23	2	2
29. Change in living environment	13	21	5	5
30. Staying away from home	9	15	7	7
31. Messy living conditions	7	11	7	7
32. Quality of food in mess	7	15	8	9
33. Difficulty in journey to and from home	8	8	4	6
34. Family problems	8	16	5	7

Among the first-year students, 53% of non-stressed subjects reported 5 or more stressors as occurring often/always as compared to 82% of stressed subjects. Among the second-year students, 35% of non-stressed subjects reported 5 or more stressors as occurring often/always as compared to 54% of stressed subjects.

DISCUSSION

Students pursuing different professional courses are exposed to varying levels of stress and pharmacy students are no exception. The present study was designed to study the level of perceived stress and common sources of stress among the first and second year students of Diploma of Pharmacy course at one point in their academic career. The PSS was chosen as the instrument to measure perceived stress in view of its established validity and reliability. (12-24)

In the present study, overall females had higher stress scores than males, which is similar to the findings of Marshall (2) et al and Jennifer (25) et al. Second-year females had the highest stress score whereas second-year males had the lowest stress score. Table 10 compares the mean PSS scores of the present study with previous studies.

Table 10: Comparison of PSS scores of present study with previous studies

	Males	Females
Present study	19.64±4.22	21.79±6.73
Jennifer et al	16.10±6.74	19.60±6.29
Marshall et al	28.10±7.70	22.40±7.70

The most common stressors in the present study were related to academics, performance in examination being the most common stressor as the students have to obtain a minimum of 40% marks in theory and practical separately in each subject to pass. If a student fails to obtain pass marks in more than three subjects, he/she is not promoted. Other common stressors are expectation after graduation, increased class workload and frequency of examination. The students have to attend theory as well as practical classes in six subjects in each year and classes are held

from 10.15 am to 4.30 pm, with a fifteen-minute break from 1.15-1.30 pm. In addition, students have to appear in three sessional examinations in each academic year. Our findings are similar to those of Jennifer (25) et al who reported class assignments (academic) as the most common stressor; in contrast, Marshall (2) et al reported family and relationships to be the most common stressor.

In the present study, 50% students reported feeling nervous/stressed fairly often/very often in the last month in response to PSS questionnaire question number 3. This is less than that reported by Marshall (2) et al (56.9%) and Jennifer (25) et al (66%).

The mean PSS score in the present study was 20.06 with a mean age of 20.79 years. This is similar to that reported by Jennifer (25) et al (mean PSS score 21.43 in <22years). However, the score is higher than that reported by Cohen (26) et al in the general population (mean PSS score 16.78 in <25 years).

In the present study, most of the students listen to music (66%), spend time with friends (36%) and watch television (33%) in their free time. When they face problems, most students talk with their friends (62%) and parents (40%) and also pray (33%), which are positive coping mechanisms. A small percentage (12%) resorted to negative behavior like indulging in smoking etc. Spending time with family and friends has also been reported to be the most common coping mechanism by Jennifer (25) et al whereas Marshall (2) et al reported exercising as the most common stress alleviator.

CONCLUSION

The present study found that students of Diploma Pharmacy course had higher stress levels compared to the general population. The most common stressors were related to academics and female reported higher stress levels compared to males. Most students resorted to positive behaviors when facing

problems. Identification of the sources of stress among students and taking appropriate measures to reduce the negative impact of the stressors will promote a healthy academic environment.

Limitations: The study was performed at a single institute and only a single assessment was done. The survey was conducted in a large classroom where students were able to view each others' responses and also, academic performance was assessed from self-reported examination score. This may have led to information bias.

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